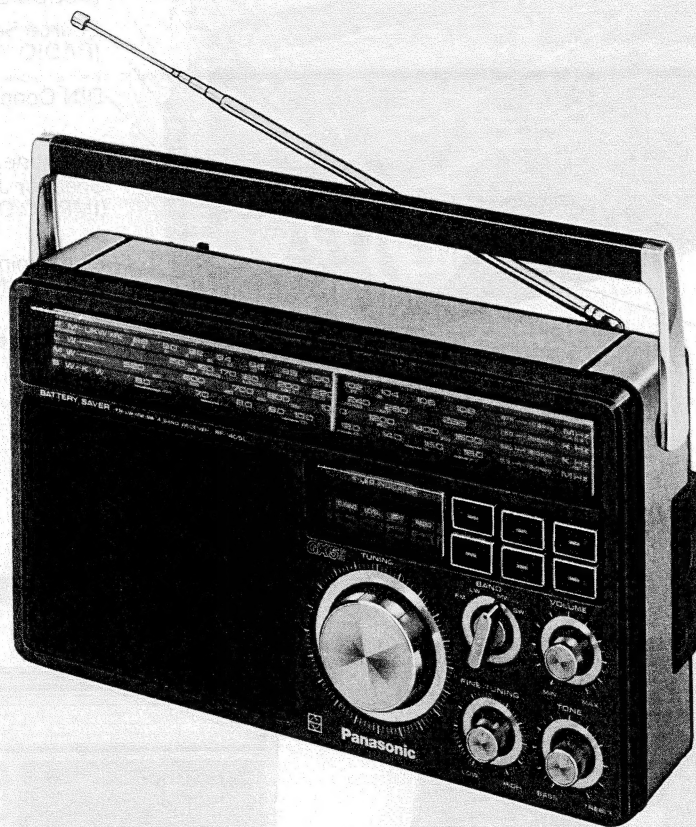


Service Manual

FM/LW/MW/SW 4-BAND
PORTABLE RADIO

Radio
RF-1405LBS



■ SPECIFICATIONS

Frequency Range:	FM 87.5~108 MHz	Power Consumption:	9 W (AC Only)
	LW 150~285 kHz (2000~1060m)		2 W (DC Max)
	MW 520~1610 kHz (577~186m)		2 W (MPO)
	SW 5.9~18 MHz (50.8~16.7m)		
Intermediate Frequency:	FM 10.7 MHz	Speaker:	10 cm (4") PM Dynamic Speaker
	AM (LW, MW & SW) 455 kHz	Dimensions:	10½" (Wide) × 6¼" (High) × 3⅜" (Deep) (266 × 158 × 80)mm
Sensitivity:	FM 1.8μV (−10 dB Limit Sens)	Weight:	3 lb. 8.4 oz. (1.6 kg) without batteries
	LW 100μV/m for 50 mW Output	Impedance:	Speaker8Ω
	MW 40μV/m for 50 mW Output		Earphone Jack8Ω
	SW 3.5μV for 50 mW Output		
Power Source:	AC 110~125/220~240 V 50/60 Hz		
	or DC 6 V (Four "C" Size Flashlight Batteries) (National UM-2 or equivalent)		

Specifications are subject to change without notice.

LOCATION OF CONTROLS AND COMPONENTS

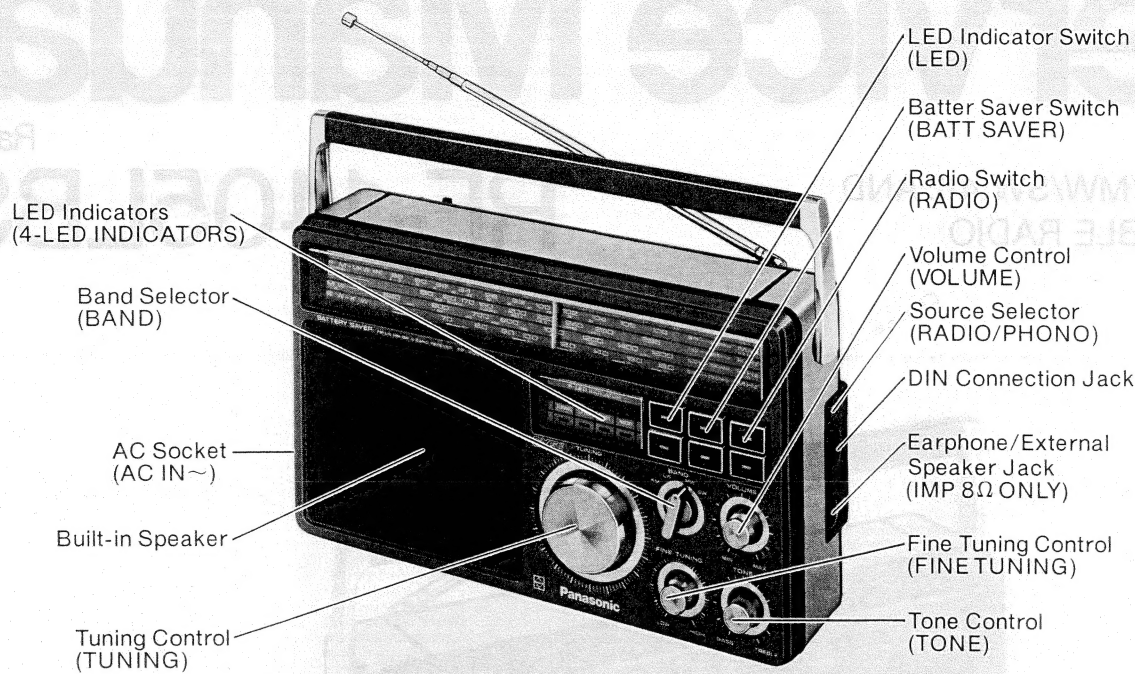


Fig. 1

DISASSEMBLY INSTRUCTION

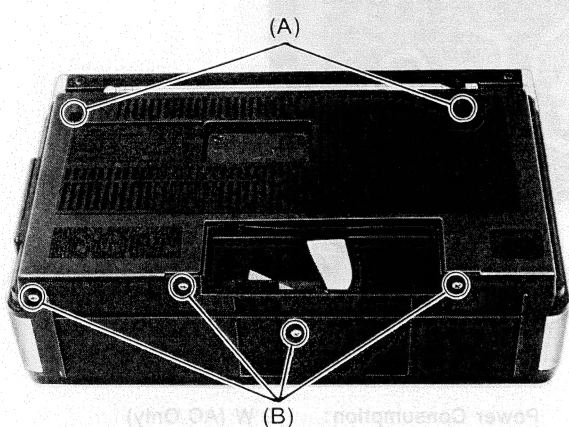


Fig. 2

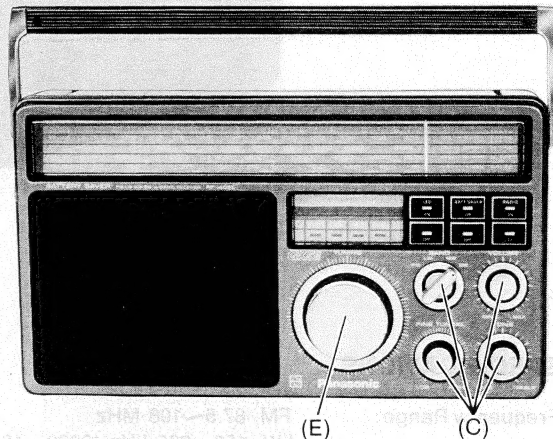


Fig. 3

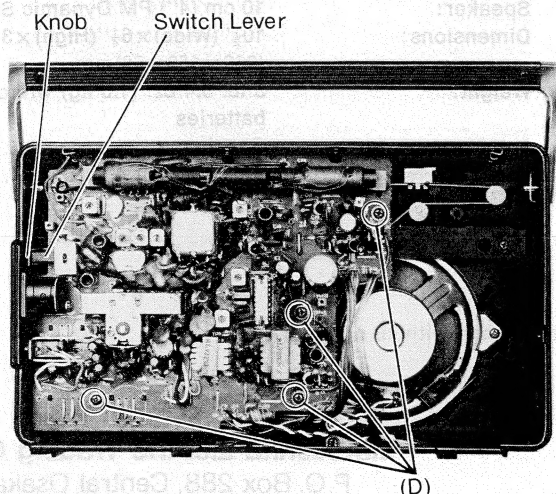


Fig. 4

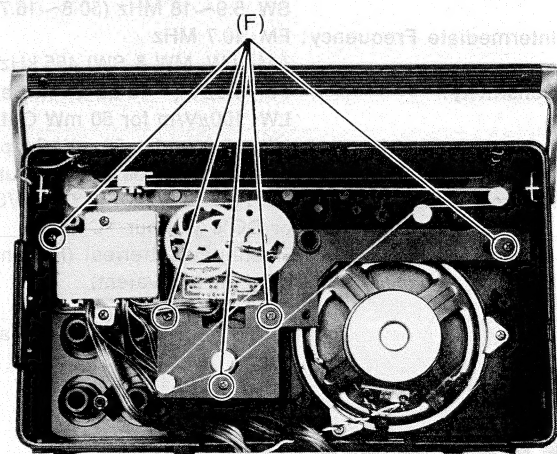


Fig. 5

ALIGNMENTS

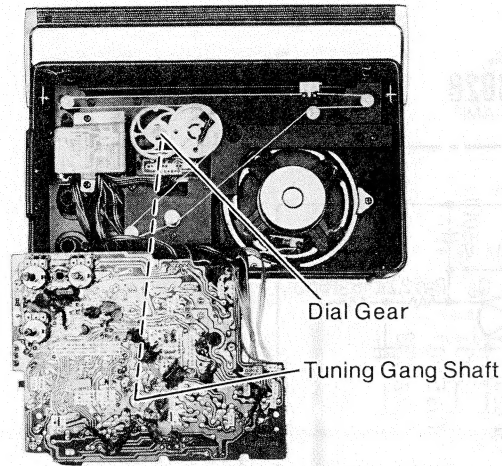


Fig. 6

DIAL THREADING

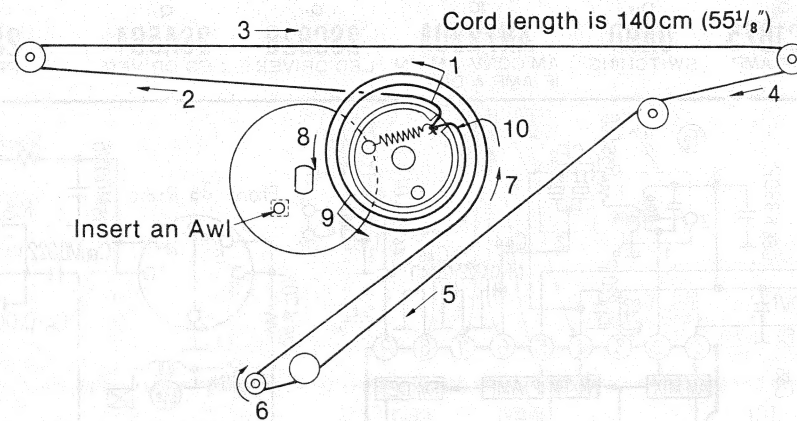


Fig. 7

Procedure	To remove—	Remove—	Shown in Fig.—
1	Printed Circuit Board ※ 1, 2, 3	Screws (3 × 45)(A) × 2	2
2		Screws (3 × 10)(B) × 4	2
3		Knobs(C) × 3	3
4		Red screws (3 × 12)(D) × 4	4
5	Dial Chassis	Knob(E) × 1	3
6		Screws (3 × 12)(F) × 5	5

Notes:

- ※ 1. Turn tuning gang shaft to fully counter-clockwise.
 ※ 2. Insert the tuning gang shaft in the hole of dial gear as shown in fig. 6.
 ※ 3. Insert the switch lever in the knob as shown in fig. 4.

ALIGNMENT POINTS

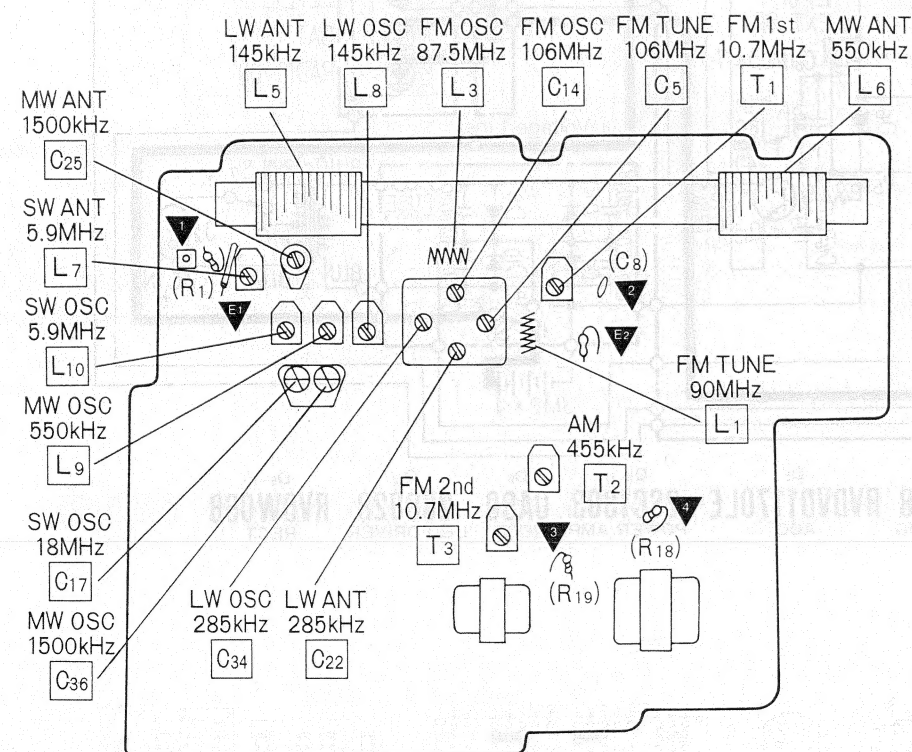


Fig. 8

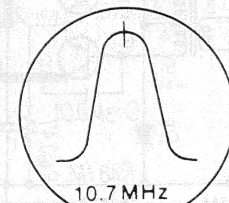


Fig. 9

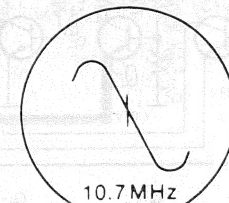


Fig. 10

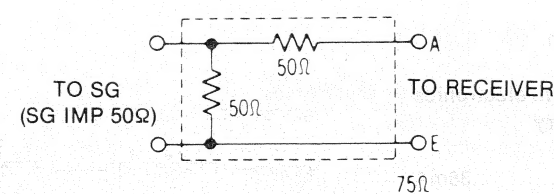




Fig. 11 FM Dummy Antenna

■ ALIGNMENT INSTRUCTION

READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

1. Set radio switch to ON.
2. Set volume control to maximum.
3. Set tone control to treble.
4. Set band switch to LW, MW, SW or FM.
5. Set LED indicator switch to OFF.
6. Set source selector to radio.
7. Set power source voltage to 6 V DC.
8. Output of signal generator should be no higher than necessary to obtain an output reading.

■ LW, MW, AND SW ALIGNMENT

BAND	SIGNAL GENERATOR or SWEEP GENERATOR		RADIO DIAL SETTING	INDICATOR (ELECTRONICS VOLTMETER or SCOPE)	ADJUSTMENT	REMARKS
	CONNECTIONS	FREQUENCY				
AM IF ALIGNMENT						
(1) MW	Fashion loop of several turns of wire and radiate signal into loop of receiver.	455 kHz 30% Mod. at 400 Hz	Point of non-interference.	Output meter across voice coil.	T ₂ (AM IFT)	Adjust for maximum output.
LW-RF ALIGNMENT						
(2) LW	"	145 kHz	145 kHz [24.1mm ($\frac{31}{32}$ ")]	Output meter across voice coil.	L ₈ (LW OSC Coil) (* 1) L ₅ (LW ANT Coil)	Adjust for maximum output. Adjust L ₅ by moving coil bobbin along ferrite core.
(3) LW	"	285 kHz	285 kHz [142.5mm($5\frac{5}{8}$ ")]	"	C ₃₄ (LW OSC Trimmer) C ₂₂ (LW ANT Trimmer)	Adjust for maximum output. Repeat steps (2) and (3).
(* 1) Cement antenna bobbin with wax after completing alignment.						
MW-RF ALIGNMENT						
(4) MW	"	550 kHz	550 kHz [17.5mm($\frac{11}{16}$ ")]	Output meter across voice coil.	L ₉ (MW OSC Coil) (* 2) L ₆ (MW ANT Coil)	Adjust for maximum output. Adjust L ₆ by moving coil bobbin along ferrite core.
(5) MW	"	1,500 kHz	1,500 kHz [141mm($5\frac{5}{8}$ ")]	"	C ₃₆ (MW OSC Trimmer) C ₂₅ (MW ANT Trimmer)	Adjust for maximum output. Repeat steps (4) and (5).
(* 2) Cement antenna bobbin with wax after completing alignment.						
SW-RF ALIGNMENT						
(6) SW	Connect to test point  through ceramic capacitor (10PF).	5.9 MHz	5.9 MHz [6mm ($\frac{1}{4}$ ")]	Output meter across voice coil.	L ₁₀ (SW OSC Coil) L ₇ (SW ANT Coil)	Adjust for maximum output.
(7) SW	Negative side to test point  .	18 MHz	18 MHz [151mm ($5\frac{7}{8}$ ")]	"	C ₁₇ (SW OSC Trimmer)	Adjust for maximum output. Repeat steps (6) and (7).

■ FM IF ALIGNMENT

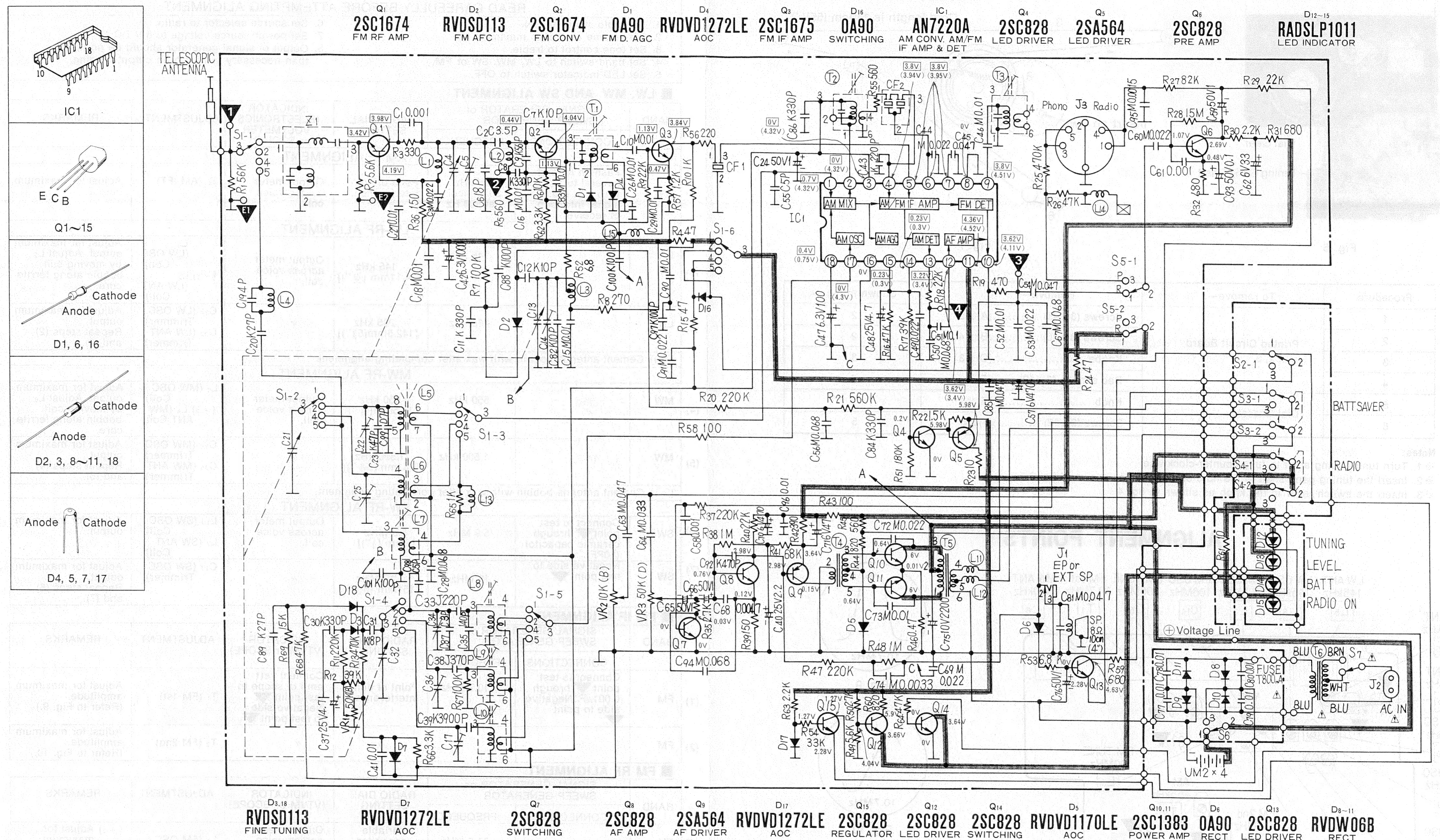
BAND	SIGNAL GENERATOR or SWEEP GENERATOR		RADIO DIAL SETTING	INDICATOR (VTVM or SCOPE)	ADJUSTMENT	REMARKS
	CONNECTIONS	FREQUENCY				
(1) FM	Connect to test point through 0.001μF. Negative side to point	10.7 MHz	Point of non-interference.	Connect vert. amp of scope to test point. Negative side to test point.	T ₁ (FM 1st)	Adjust for maximum amplitude. (Refer to Fig. 9.)
(2) FM	"	"	"	"	T ₃ (FM 2nd)	Adjust for maximum amplitude. (Refer to Fig. 10.)

■ FM RF ALIGNMENT

BAND	SIGNAL GENERATOR or SWEEP GENERATOR		RADIO DIAL SETTING	INDICATOR (VTVM or SCOPE)	ADJUSTMENT	REMARKS
	CONNECTIONS	FREQUENCY				
(1) FM	Connect to test point through FM dummy antenna. (Refer to Fig. 11.)	87.5 MHz	Variable capacitor fully closed.	Output meter across voice coil.	L ₃ (FM OSC Coil)	(* 3) Adjust for maximum output.
(2) FM		90 MHz	90 MHz [21mm (13/16")]	"	L ₁ (FM TUNE Coil)	(* 3) Adjust for maximum output.
(3) FM		106 MHz	106 MHz [130mm (5 1/8")]	"	C ₁₄ (FM OSC Trimmer) C ₅ (FM TUNE Trimmer)	(* 3) Adjust for maximum output. Repeat steps. (1)~(3).

(* 3) Three output responses will be present; proper tuning is the center frequency.

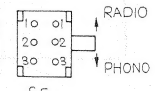
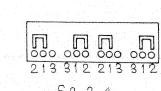
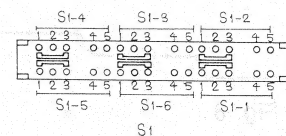
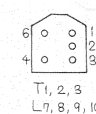
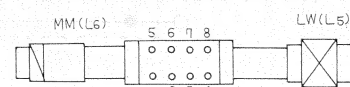
SCHEMATIC DIAGRAM MODEL RF-1405LBS



Notes:

- S1-1~S1-6: Band switch in "FM" position.
(1...FM, 2...LW, 4...MW, 5...SW)
- S2-1, S2-2: LED switch in "ON" position.
(1...ON, 3...OFF)
- S3-1, S3-2: Battery saver switch in "ON" position.
(1...ON, 3...OFF)
- S4-1, S4-2: Power switch in "ON" position.
(1...ON, 3...OFF)
- S5-1, S5-2: Radio/Phono switch in "RADIO" position.
(1...RADIO, 3...PHONO)
- S6: AC/DC select switch in "DC" position.
- S7: Voltage selector.
- DC voltage measurements are taken with electronics voltmeter from negative terminal of battery.
□...FM position, ()...AM position.
- Battery current: No signal38mA
Maximum output700mA
- △ indicates that only parts specified by the manufacture be used for safety.
- The mark (▼) shows test point. e.g. ▼=test point 1.

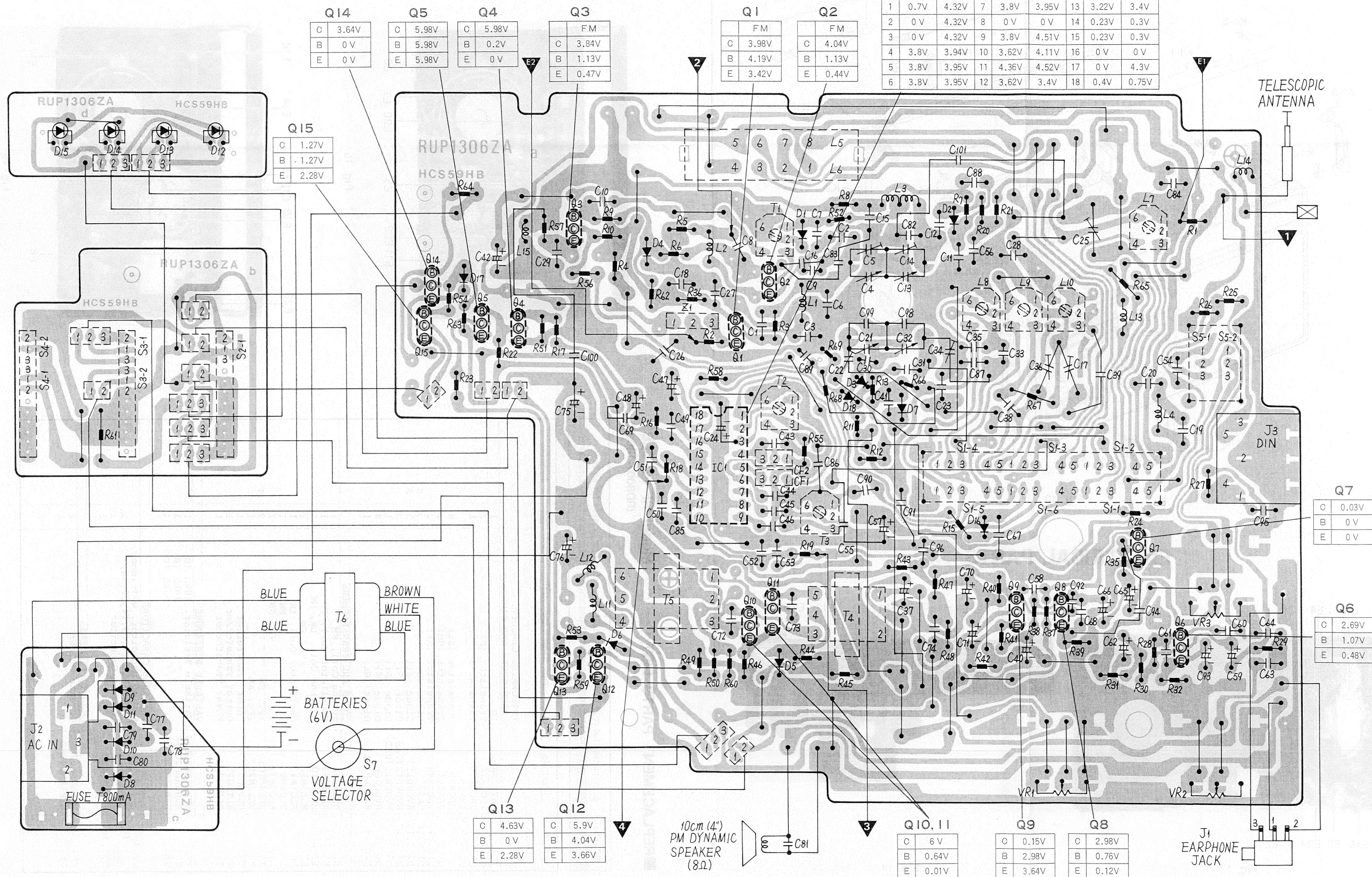
BOTTOM VIEW



CIRCUIT BOARD WIRING VIEW MODEL RF-1405LBS

IC1

	FM	AM		FM	AM		FM	AM
1	0.7V	4.32V	7	3.8V	3.95V	13	3.22V	3.4V
2	0V	4.32V	8	0V	0V	14	0.23V	0.3V
3	0V	4.32V	9	3.8V	4.51V	15	0.23V	0.3V
4	3.8V	3.94V	10	3.62V	4.11V	16	0V	0V
5	3.8V	3.95V	11	4.36V	4.52V	17	0V	4.3V
6	3.8V	3.95V	12	3.62V	3.4V	18	0.4V	0.75V



CABINET PARTS

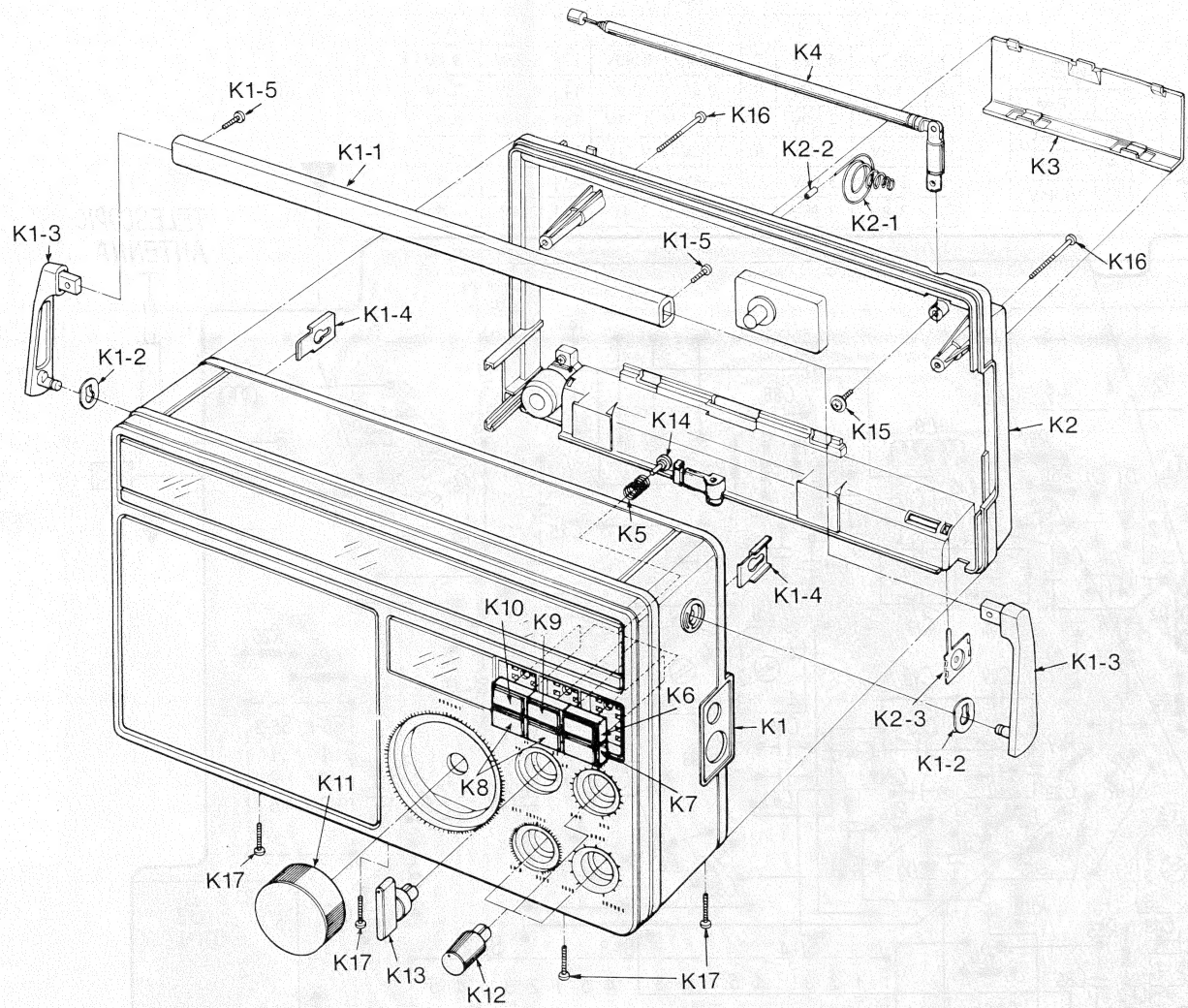


Fig. 12

ELECTRICAL PARTS

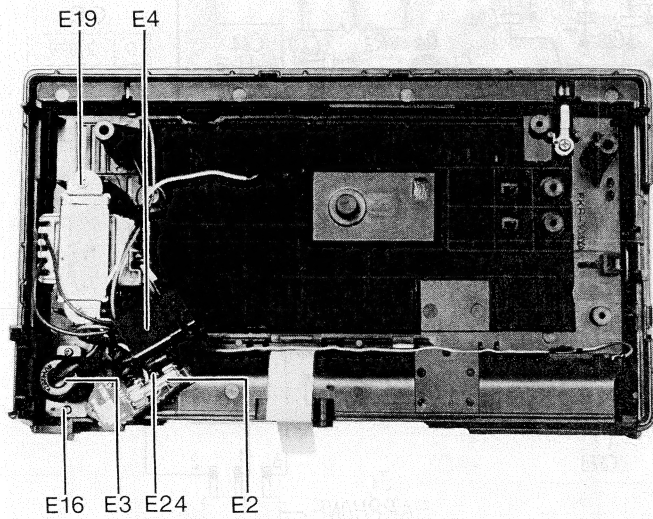


Fig. 13

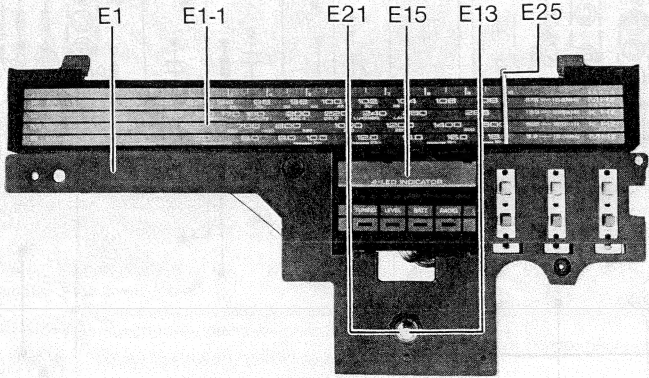


Fig. 14

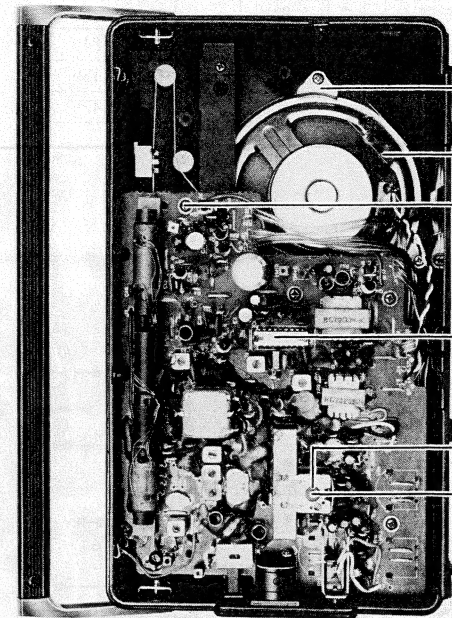


Fig. 15

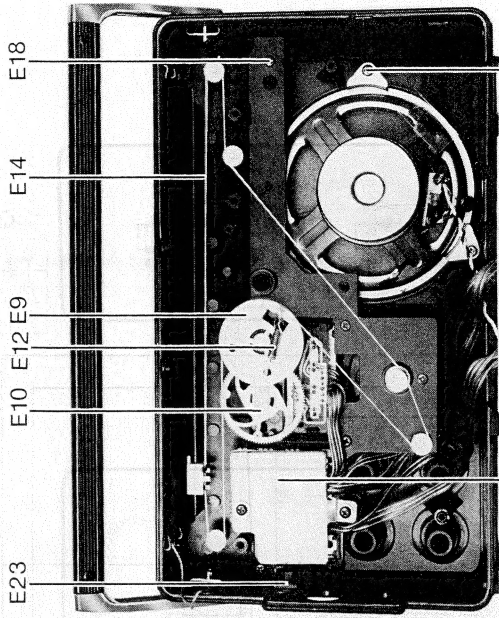


Fig. 16

REPLACEMENT PARTS LISTModel RF-1405LBS (RD8007-1803C)

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
INTEGRATED CIRCUIT, TRANSISTORS AND DIODES				
IC1	AN7220A	IC	1	
Q1, 2	2SC1674	Transistor (Si)	2	
Q3	2SC1675	Transistor (Si)	1	
Q4, 6, 7, 8	12~15	Transistor (Si)	8	
Q5, 9	2SC828	Transistor (Si)	2	
Q10, 11	2SA564	Transistor (Ge)	2	
D1, 6, 16	2SC1383	Transistor (Si)	3	
D2, 3, 18	OA90	Diode (Ge)	3	
D4, 7, 17	RVDSDL13	Diode (Si)	3	
D5	RVDVDL272LE	Diode (Si)	1	
D8~11	RVDVDL170LE	Diode (Si)	4	
D12~15	RVDW06B	Diode (Si)	4	
	RADSLP1011	Diode (Ga)	1	
COILS AND TRANSFORMERS				
L1	RLD4Y44	Tuning Coil, FM	1	
L3	RLO4Y43	Oscillator Coil, FM	1	
L5, 6	RLF6E10	Antenna Coil, LW, MW	1	
L7	RLA3M10	" " SW	1	
L8	RL01M4	Oscillator Coil, LW	1	
L9	RL02M6	" " MW	1	
L10	RL03M31	" " SW	1	
T1, 3	RLI4M101	IFT, FM	2	
T2	RLI2M213	IFT, AM	1	
T4	RLT3F33	Input Transformer	1	
T5	RLT2G28	Output Transformer	1	
T6	RLT5J269	Power Transformer	1	
VARIABLE RESISTORS				
VR1	EVH0XAF20B54	Variable Resistor, 50kΩ (B)	1	
VR2	EVH0XAF20B14	" " 10kΩ (B)	1	
VR3	EVH0XAF20D54	" " 50kΩ (D)	1	
VARIABLE CAPACITORS				
C3, 4, 21, 32	RCV4RC2V1L	Tuning Capacitor, w/Trimmer	1	
C25	RCV1T-16M	Capacitor (C5, 14, 22, 34)	1	
C17, 36	RCV2T-16M	Trimmer Capacitor	1	
CERAMIC FILTERS				
CF1	RVFSFE107MSR	Ceramic Filter	1	
CF2	RVFCFM2455D	" "	1	

NOTES: 1. Δ indicates that only parts specified by the manufacturer be used for safety.
2. The S mark indicates service standard parts and may differ from production parts.

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
		COMPONENT COMBINATION		
Z1	RXABPWB5	Component Combination	1	
		SPEAKER		
	EAS10P182S	Speaker, 10cm (4"), 8Ω	1	
		SWITCHES		
S1	RSR4F02Z	Switch, Band	1	
S2~S4	RSHX028Z	" LED, BATT SAVE, RADIO	3	
S5	TSE346	" Radio/Phono	1	⚠
S7	RSR2A01Y	" Voltage Selector	1	
		JACKS		
J1	RJJ32E	Jack, Earphone	1	S
J2	RJJ115Z	" AC IN	1	⚠
J3	RJS15A	" Din	1	
		RESISTORS (Value is in OHMS)		
R2,49	ERD25TJ562	5.6 k 1/4W Carbon	2	S
R1	ERD25TJ563	56 k "	1	S
R18	ERD25TJ222	2.2 k "	1	S
R4,15,24	ERD25TJ470	47 k "	3	S
R53	ERD25TJ682	6.8 k "	1	S
R23,61	ERD25TJ100	10 k "	2	S
R52	ERD25TJ688	6.8 k "	1	S
R43,58	ERD25TJ101	100 k "	2	S
R36,39	ERD25TJ151	150 k "	2	S
R8	ERD25TJ271	270 k "	1	S
R3	ERD25TJ331	330 k "	1	S
R42	ERD25TJ391	390 k "	1	S
R19	ERD25TJ471	470 k "	1	S
R5,45,55	ERD25TJ561	560 k "	3	S
R31,32,59	ERD25TJ681	680 k "	3	S
R44,60	ERD25TJ821	820 k "	2	S
R56	ERD25TJ221	220 k "	1	S
R57	ERD25TJ122	1.2 k "	1	S
R10,65	ERD25TJ102	1 k "	2	S
R30,40,63	ERD25TJ222	2.2 k "	3	S
R35,50	ERD25TJ272	2.7 k "	2	S
R62,66	ERD25TJ332	3.3 k "	2	S
R6	ERD25TJ103	10 k "	1	S
R22,69	ERD25TJ153	15 k "	2	S
R12,17	ERD25TJ393	39 k "	2	S
R16,26,64,68	ERD25TJ473	47 k "	4	S
R41	ERD25TJ683	68 k "	1	S
R27	ERD25TJ823	82 k "	1	S
R9,29	ERD25TJ223	22 k "	2	S
R54	ERD25TJ333	33 k "	1	S
R7,67	ERD25TJ104	100 k "	2	S
R51	ERD25TJ184	180 k "	1	S
R11,20,37,47	ERD25TJ224	220 k "	4	S

. Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
R13,25	ERD25TJ474	470 k 1/4W Carbon	2	S
R21	ERD25TJ564	560 k "	1	S
R38,48	ERD25TJ105	1 M "	2	S
R28	ERD25TJ155	1.5 M "	1	
R46	ERX1ANJR47	0.47 1W Metal	1	S
		CAPACITORS (Value is in MICRO FARADS except P.P=PICO FARADS)		
C19	ECCD1H040C	4 P 50V Ceramic	1	
C55,98	ECCD1H050CC	5 P "	2	
C7,12,82	ECCD1H100KC	10 P "	3	
C20,89	ECCD1H270KC	27 P "	2	
C43	ECCD1H221K	220 P "	1	
C8,11,30	ECCD1H331K	330 P "	5	
C99	ECCD1H070DC	7 P "	1	
C9	ECCD1H560KC	56 P "	2	
C2	ECCD1H3R5C	3.5 P "	1	
C23	ECCD1H470KC	47 P "	1	
C92	ECCD1H471KB	470 P "	1	
C6,31	ECCD1H180KC	18 P "	2	
C87	ECCD1H030C	3 P "	1	
C88,97,100,101	ECCD1H101K	100 P "	4	
C92	ECKD1H471KB	470 P "	1	
C1,58,61	ECKD1H102ZF	0.001 "	3	
C10,15,16,18,26,29,46,52,83,90	ECKD1H103MD	0.01 "	10	
C74	ECKD1H332MD	0.0033 "	1	
C49	ECKD1H223ZF	0.022 "	1	
C68	ECKD1H472MD	0.0047 "	1	
C27,41,77~80,96	ECKD1H103ZF	0.01 "	7	
C95	ECKD1H152MD	0.0015 "	1	
C38	ECQS05371JZ	370 P Styrol	1	
C39	ECQS05392KZ	3900 P "	1	
C33	ECQS05221JZ	220 P "	1	
C35	ECQS05141JZ	140 P "	1	
C73	ECFVD103MD	0.01 25V Semi-Conductor	1	
C3,53,60,69,72,91	ECFVD223MD	0.022 "	6	
C45,54,63,81,85	ECFVD473MD	0.047 "	5	
C28,50,56,67,94	ECFVD683MD	0.068 "	5	
C51	ECFVD104MD	0.1 "	1	
C44	ECFVD153MD	0.015 "	1	
C64	ECFVD333MD	0.033 "	1	
C62	ECEA1CS330	33 16V Electrolytic	1	S
C71	ECEA1AS470	47 10V "	1	S
C57,70	ECEA0JS471	470 6.3V "	2	S
C47	ECEA1AS101	100 10V "	1	S
C42	ECEA0JS102	1000 6.3V "	1	S
C75	ECEA1CS222	2200 16V "	1	S

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
C37,48 C24,59,65	ECEA25Z4R7 5,66,76	4.7 25V Electrolytic	2	S
	ECEA50Z1	1 50V "	5	S
C40	ECEA50Z2R2	2.2 " "	1	S
C93	ECEA50ZR1	0.1 " "	1	S
CABINET PARTS				
K1	RYMF1405LBSX	Front Cabinet Ass'y	1	
K1-1	RKX199Z	Handle	1	
K1-2	RKX184Z	Spacer, Arm	2	
K1-3	RKX204Z	Arm, Handle	2	
K1-4	QBP1817	Stopper, Arm	2	
K1-5	XSB3+6FZ	Screw, Handle M'tg	2	
K2	RYFF1405LBSX	Rear Cabinet Ass'y	1	
K2	RYFF1405LBSF	Rear Cabinet Ass'y, for Itary, France & Finland	1	
K2-1	RJC603Z	Spring, Battery - Side	1	
K2-2	RJT398A	Connecting Pipe	1	
K2-3	RJC205B	Terminal, Battery + Side	1	
K3	RYNF1405LBSX	Battery Cover Ass'y	1	
K4	XEARR170FKY	Telescopic Antenna	1	
K5	RDS5104Z	Spring, Button	6	
K6	RBC279P	Button, Radio On	1	
K7	RBC279Q	Button, Radio Off	1	
K8	RBC279R	" Off	2	
K9	RBC279S	" Batt Saver	1	
K10	RBC279T	" LED On	1	
K11	RBN533Z	Knob Tuning	1	
K12	RBN534Z	" Volume	3	
K13	RBS168Z	" Band	1	
K14	RHR1127Z	Stopper, Button	6	
K15	XTW3+10F	Screw, Telescopic Antenna M'tg	1	
K16	XTB3+45CFN	" , Cabinet M'tg	2	
K17	XTN3+10B	" , "	4	S
ELECTRICAL PARTS				
E1	RZAF1405LBSX	Dial Chassis Ass'y	1	
E1-1	RKD563Z	Dial Scale	1	
E2	QTF1054	Holder, Fuse	2	⚠
E3	RUV426Z	Cover, Voltage Selector	1	⚠
E4	RUV482Z	Cover, AC IN Jack	1	⚠
E5	RMC607Z	Shield Cover, IC	1	
E6	RMS12B	Bracket, Speaker	3	
E7	RMX198Z	Insulator	1	
E8	RMX183Z	Insulator	1	
E9	RDD3383Z	Drum, Dial	1	
E10	RDG5694Z	Gear, Dial	1	
E11	RDF864Z	Shaft, Band Switch	1	
E12	RDS4090A	Spring, Dial	1	
E13	RDT2252Z	Shaft, Tuning	1	
E14	RDZ05Z	Cord, Dial	1	
			ROLL	
E15	RGK957Z	Indicating Plate, LED	1	
E16	XTN23+8B	Screw, Voltage Selector M'tg	2	S

Ref. No.	Part No.	Part Name & Description	Per Set	Remarks
E17	XTN3+10B	Screw, Speaker M'tg	3	S
E18	XTN3+12B	" Chassis M'tg	5	S
E19	XTW3+16F	" Transformer M'tg	2	
E20	XTW3+12FR	Red Screw, PC Board M'tg	6	
E21	XNS9	Nut, Tuning Shaft M'tg	1	S
E22	XUC25FT	Circlip	1	S
E23	RBD122Z	Knob, Radio/Phono	1	
E24	XBA2C05TRO	Fuse, T500mA	1	⚠
E25	RDP813Z	Pointer, Dial	1	
ACCESSORIES				
	XEH1A1-P	Magnetic Earphone	1	S
	RJA20Z	Power Cord, AC	1	S
	RQE13Z	Caution Tag	1	⚠
PACKING MATERIALS				
	XZB40X30A04	Polyethylene Cover	1	S
	XZB10X25A04	"	1	S
	RPN9347Z	Pad Complete	1	
	RPK984Z	Gift Box	1	
PRINTED MATERIALS				
	RQX6597Z	Instruction Book	1	
	RQX6619Z	Instruction Book, for Itary	1	

Service Manual

Radio

RF-1405LBS

Supplement - 1

FM/LW/MW/SW 4-BAND
PORTABLE RADIO



FTZ No.

FTZ 11/630

Matsushita Electric

Part No. 777998

- Printed Circuit Board has been changed since July, 1983 to meet new FTZ regulation.
- Please use this manual for model RF-1405LBS which has FTZ No. on the name plate as shown figure left.

SPECIFICATIONS

Frequency Range:	FM 87.5~108 MHz
	LW 150~285 kHz (2000~1060m)
	MW 520~1610 kHz (577~186m)
	SW 5.9~18 MHz (50.8~16.7m)
Intermediate Frequency:	FM 10.7 MHz
	AM (LW, MW & SW) 455 kHz
Sensitivity:	FM 1.8 μ V (−10 dB Limit Sens)
	LW 100 μ V/m for 50 mW Output
	MW 40 μ V/m for 50 mW Output
	SW 3.5 μ V for 50 mW Output
Power Source:	AC 110~125/220~240 V 50/60 Hz
	or DC 6 V (Four "C" Size Flashlight Batteries) (National UM-2 or equivalent)

Power Consumption:	9 W (AC Only)
Power Output:	2 W (DC Max)
	2 W (MPO)
Speaker:	10 cm (4"), 8 Ω PM Dynamic Speaker
Dimensions:	266 (Wide)×158 (High)×80 (Deep) mm
	(10 1/2"×6 1/4"×3 1/8")
Weight:	3 lb. 8.4 oz. (1.6 kg) without batteries
Impedance:	Speaker.....8 Ω
	Earphone Jack.....8 Ω

Specifications are subject to change without notice.

Panasonic

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

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LOCATION OF CONTROLS AND COMPONENTS

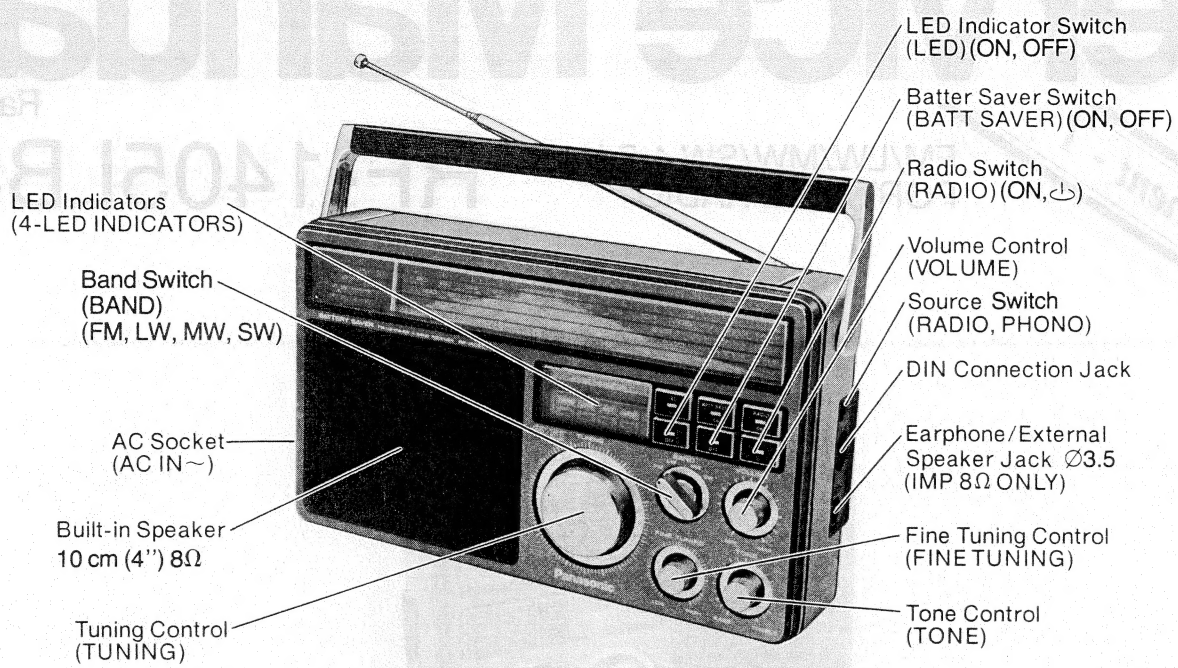


Fig. 1

DISASSEMBLY INSTRUCTIONS

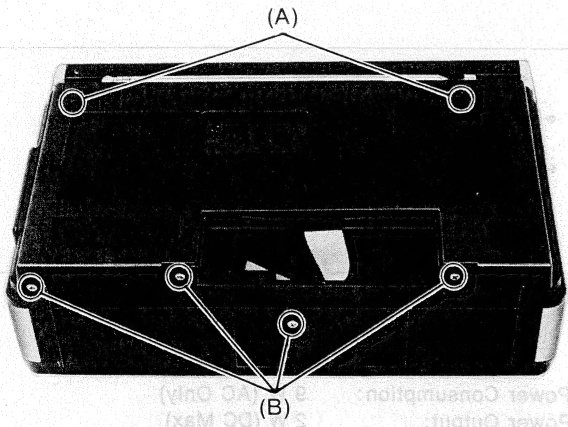


Fig. 2

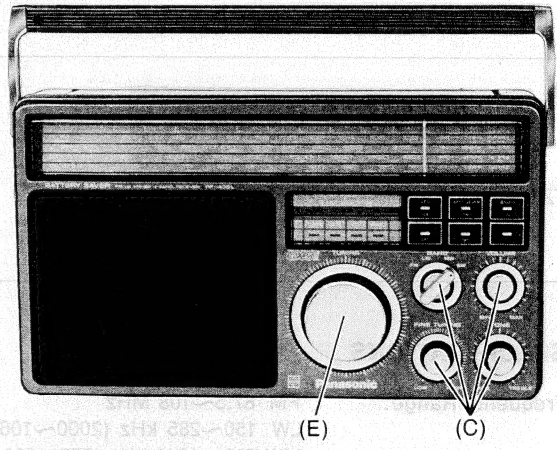


Fig. 3

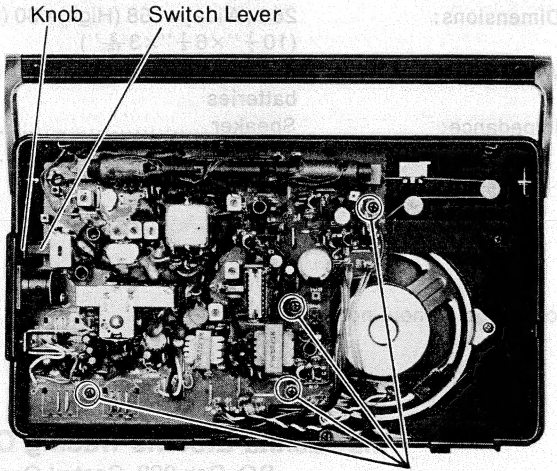


Fig. 4

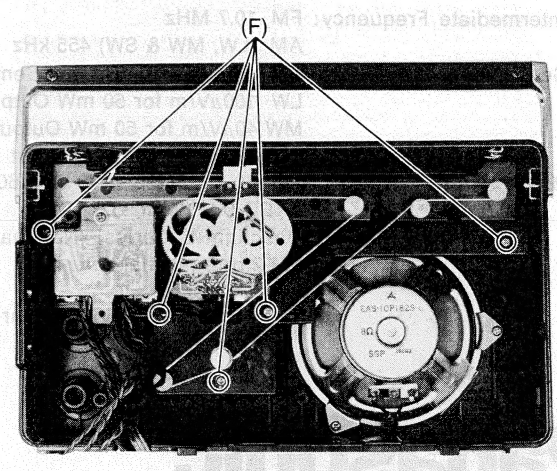


Fig. 5

DIAL THREADING

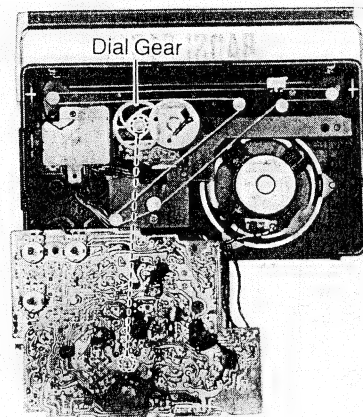


Fig. 6

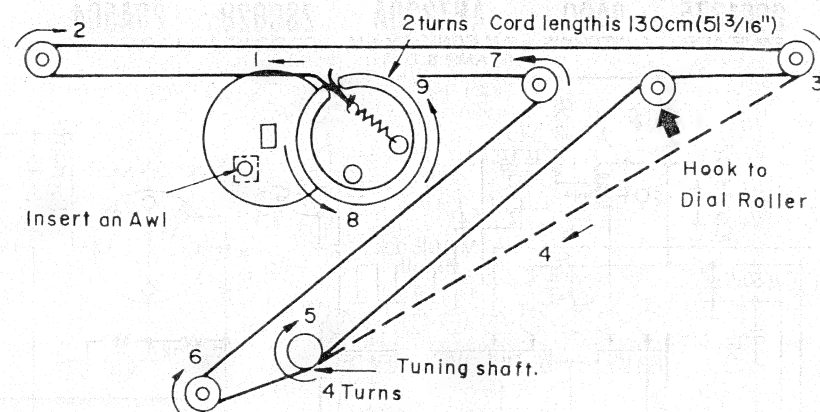


Fig. 7

Procedure	To remove—	Remove—	Shown in Fig.—
1	Printed Circuit Board ※ 1, 2, 3	Screw (3 × 45)(A) × 2	2
2		Screw (3 × 10)(B) × 4	2
3		Knob(C) × 4	3
4		Red screw (3 × 12)(D) × 4	4
5	Dial Chassis	Knob(E) × 1	3
6		Screw (3 × 12)(F) × 5	5

Notes:

- ※ 1. Turn tuning capacitor shaft to fully counter-clockwise.
- ※ 2. Insert the Tuning capacitor shaft in the hole of dial gear as shown in fig. 6.
- ※ 3. Insert the switch lever in the knob as shown in fig. 4.

MEASUREMENTS AND ADJUSTMENTS

■ ALIGNMENT POINTS

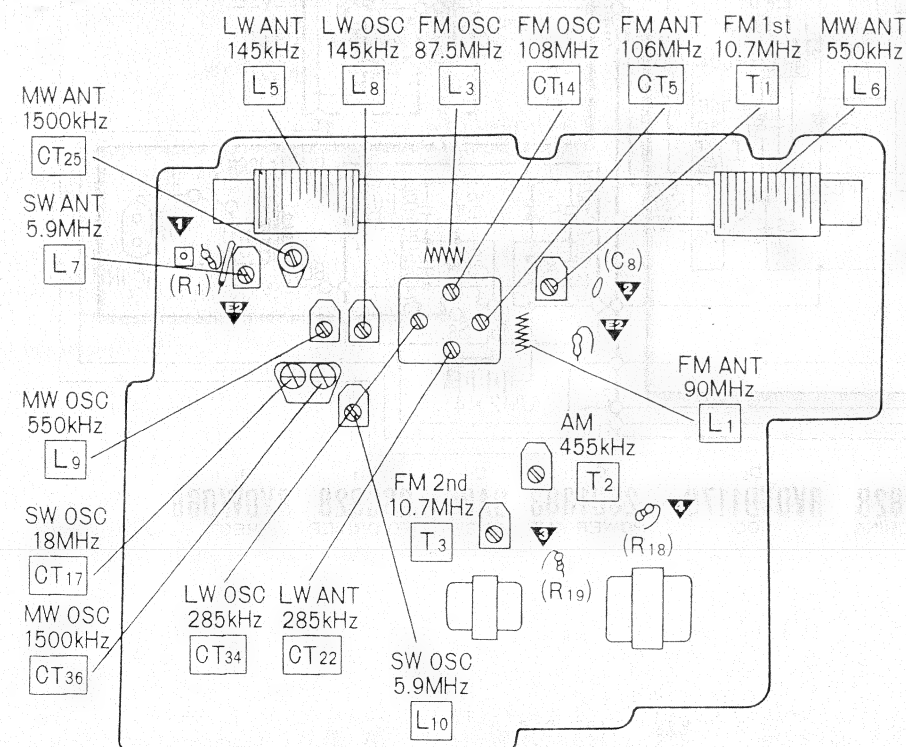


Fig. 8

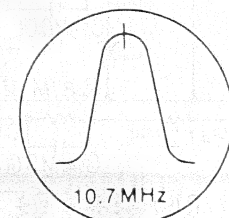


Fig. 9

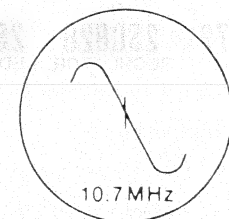


Fig. 10

■ ALIGNMENT INSTRUCTION

READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

1. Set radio switch to ON.
2. Set volume control to maximum.
3. Set tone control to treble.
4. Set band switch to LW, MW, SW or FM.
5. Set LED indicator switch to OFF.
6. Set source switch to radio.
7. Set fine tuning to center.
8. Set battery saver switch to OFF.
9. Set power source voltage to 6 V DC.
10. Output of signal generator should be no higher than necessary to obtain an output reading.

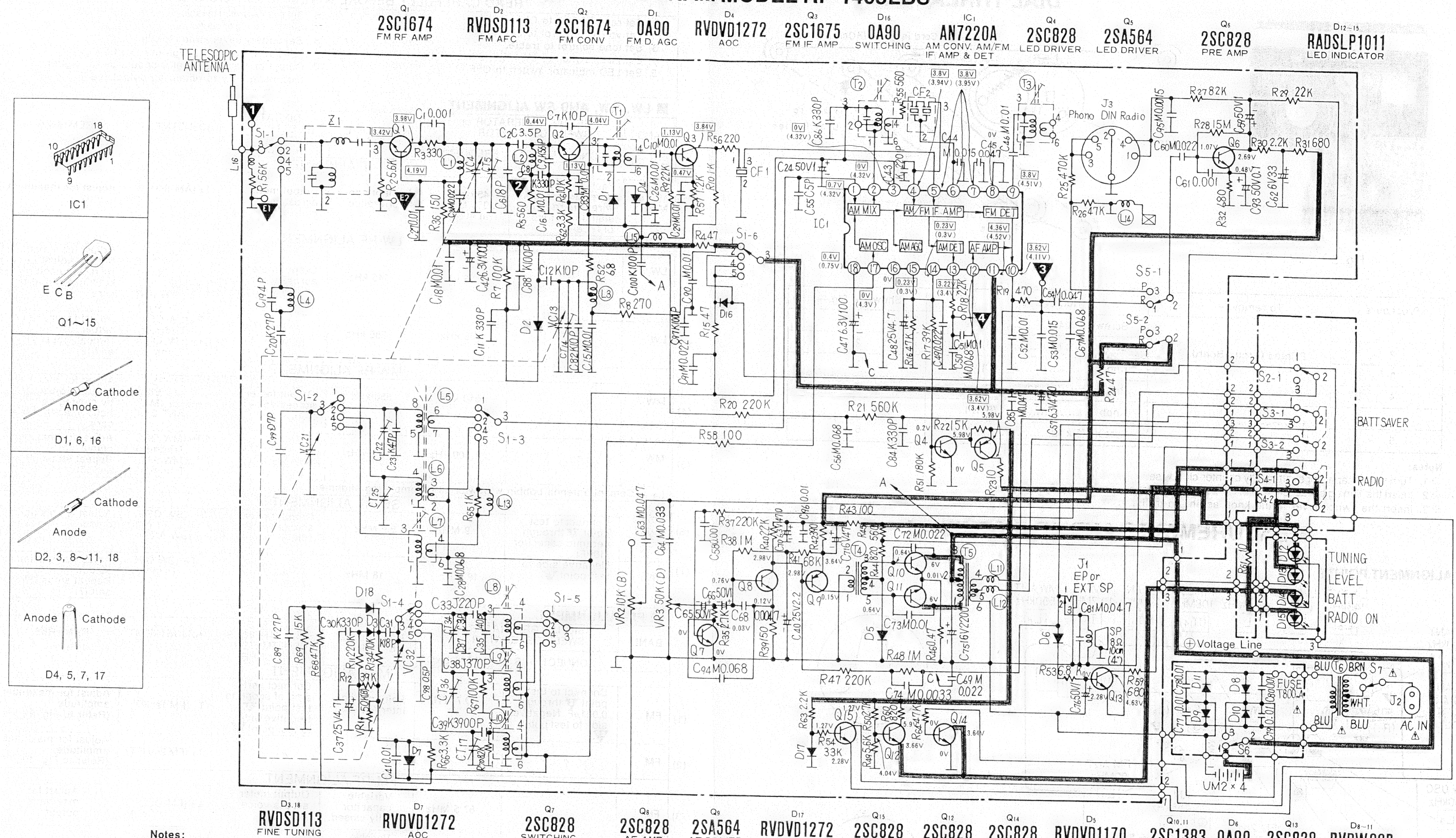
■ LW, MW, AND SW ALIGNMENT

BAND	SIGNAL GENERATOR or SWEEP GENERATOR	RADIO DIAL SETTING	INDICATOR (ELECTRONICS VOLTMETER or SCOPE)	ADJUSTMENT	REMARKS
AM-IF ALIGNMENT					
(1) MW	Fashion loop of several turns of wire and radiate signal into loop of receiver.	455 kHz 30% Mod. at 400 Hz	Point of non-interference.	Output meter across voice coil.	T ₂ (AM IFT) Adjust for maximum output.
LW-RF ALIGNMENT					
(2) LW	"	145 kHz	145 kHz	Output meter across voice coil.	L ₅ (LW OSC Coil) (* 1) L ₅ (LW ANT Coil) Adjust for maximum output. Adjust L ₅ by moving coil bobbin along ferrite core.
(3) LW	"	285 kHz	285 kHz	"	CT ₃₄ (LW OSC Trimmer) CT ₂₂ (LW ANT Trimmer) Adjust for maximum output. Repeat steps (2) and (3).
MW-RF ALIGNMENT					
(4) MW	"	550 kHz	550 kHz	Output meter across voice coil.	L ₉ (MW OSC Coil) (* 1) L ₉ (MW ANT Coil) Adjust for maximum output. Adjust L ₉ by moving coil bobbin along ferrite core.
(5) MW	"	1,500 kHz	1,500 kHz	"	CT ₃₆ (MW OSC Trimmer) CT ₂₅ (MW ANT Trimmer) Adjust for maximum output. Repeat steps (4) and (5).
(* 1) Cement antenna bobbin with wax after completing alignment.					
SW-RF ALIGNMENT					
(6) SW	Connect to test point ▼ through ceramic capacitor (10PF). Negative side to test point ▼.	5.9 MHz	5.9 MHz	Output meter across voice coil.	L ₁₀ (SW OSC Coil) L ₇ (SW ANT Coil) Adjust for maximum output.
(7) SW	"	18 MHz	18 MHz	"	CT ₁₇ (SW OSC Trimmer) Adjust for maximum output. Repeat steps (6) and (7).

■ FM ALIGNMENT

BAND	SIGNAL GENERATOR or SWEEP GENERATOR		RADIO DIAL SETTING	INDICATOR (ELECTRONICS VOLTMETER or SCOPE)	ADJUSTMENT	REMARKS
	CONNECTIONS	FREQUENCY				
FM-IF ALIGNMENT						
(1)	FM	Connect to test point ▼ through 0.001μF. Negative side to test point ▼.	10.7 MHz	Point of non-interference.	Connect vert. amp of scope to test point ▼. Negative side to test point ▼.	T ₁ (FM 1st IFT) Adjust for maximum amplitude. (Refer to Fig. 9.)
(2)	FM	"	"	"	"	T ₃ (FM 2nd IFT) Adjust for maximum amplitude. (Refer to Fig. 10.)
FM-RF ALIGNMENT						
(3)	FM	Connect to test point ▼ through FM dummy antenna. Negative side to test point ▼.	87.5 MHz	Variable capacitor fully closed.	Output meter across voice coil.	L ₃ (FM OSC Coil) (* 2) Adjust for maximum output.
(4)	FM		108 MHz	Variable capacitor fully open	"	CT ₁₄ (FM OSC Trimmer) "
(5)	FM		90 MHz	Tune to signal.	"	L ₁ (FM ANT Coil) (* 2) Adjust for maximum output.
(6)	FM		106 MHz	"	"	CT ₅ (FM ANT Trimmer) (* 2) Adjust for maximum output. Repeat steps. (3)~(6).
(* 2) Three output responses will be present; proper tuning is the center frequency.						

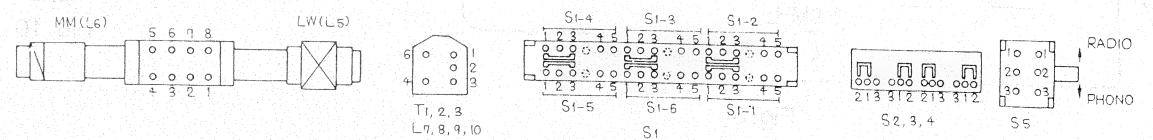
SCHEMATIC DIAGRAM MODEL RF-1405LBS



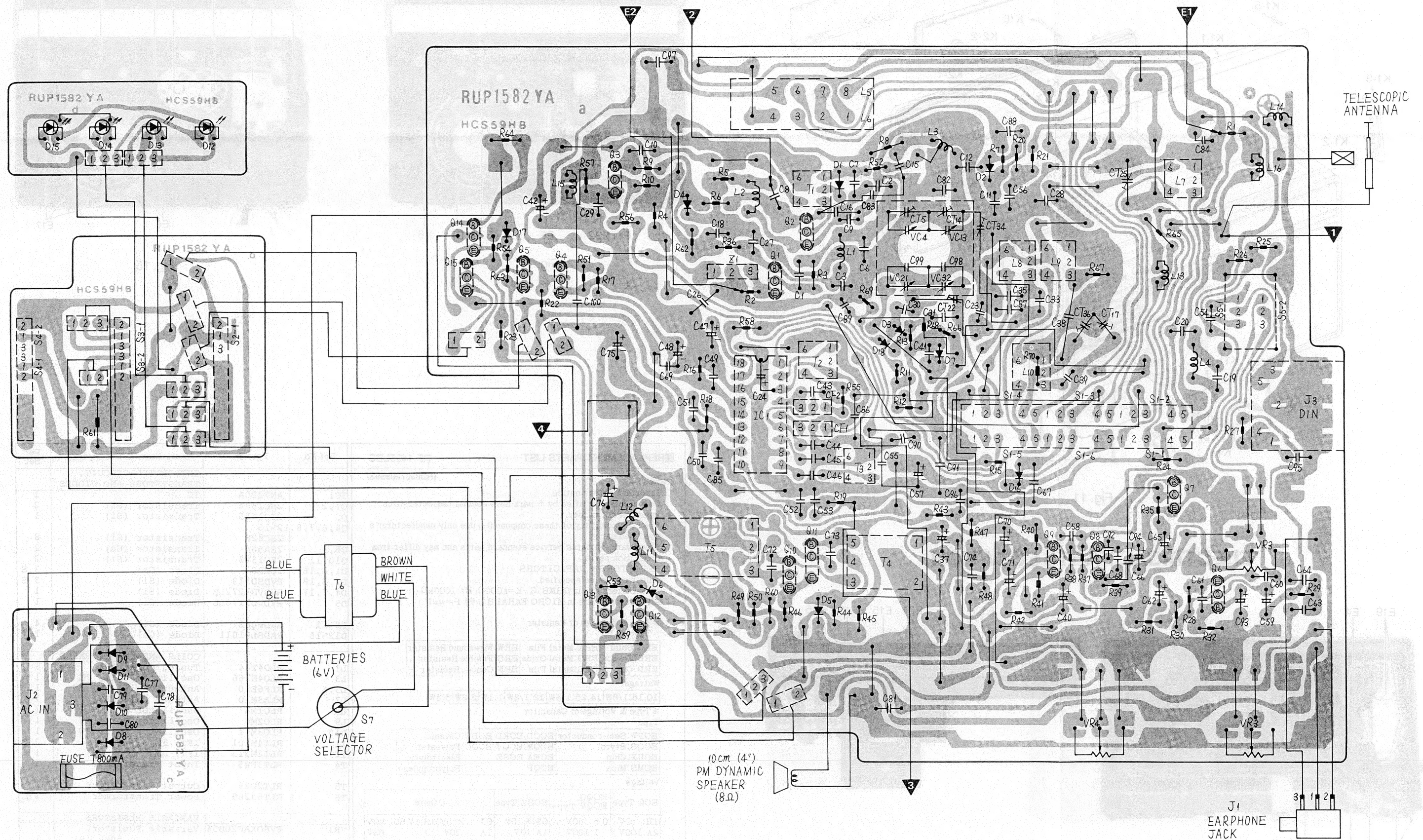
Notes:

- S1-1~S1-6: Band switch in "FM" position.
(1...FM, 2...LW, 4...MW, 5...SW)
- S2-1, S2-2: LED Indicator switch in "ON" position.
(1...ON, 3...OFF)
- S3-1, S3-2: Battery saver switch in "ON" position.
(1...ON, 3...OFF)
- S4-1, S4-2: Radio switch in "ON" position.
(1...ON, 3...OFF)
- S5-1, S5-2: Source switch in "RADIO" position.
(1...RADIO, 3...PHONO)
- S6: AC/DC select switch in "DC" position.
- S7: Voltage selector.
- DC voltage measurements are taken with electronics voltmeter from negative terminal of battery.
□...FM position, ()...AM position.
- Battery current: No signal38mA
Maximum output700mA
- Important safety notice
Components identified by Δ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
- The mark (∇) shows test point. e.g. ∇ =test point 1.

BOTTOM VIEW



CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM MODEL RF-1405LBS



CABINET PARTS LOCATION

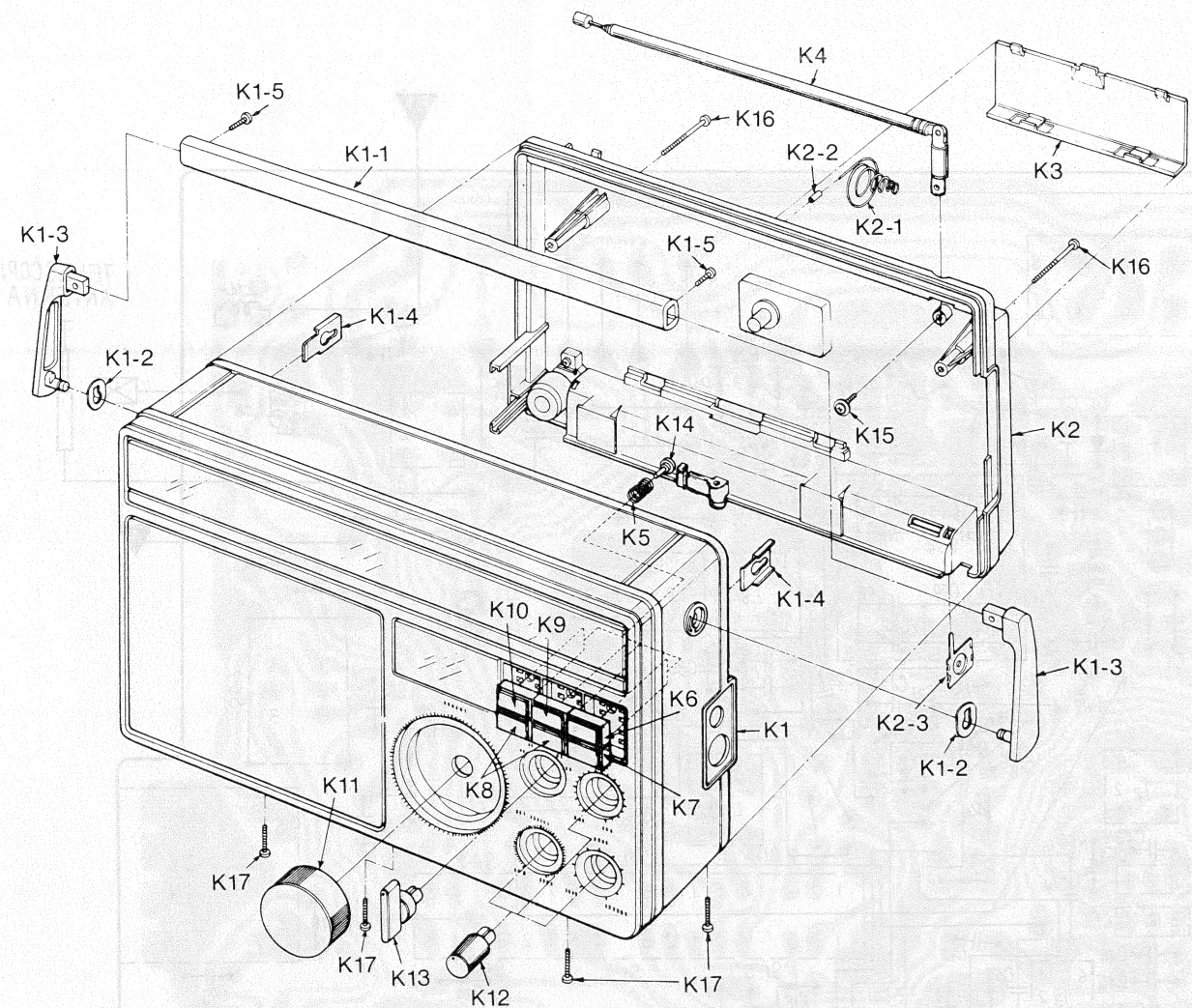


Fig. 11

ELECTRICAL PARTS LOCATION

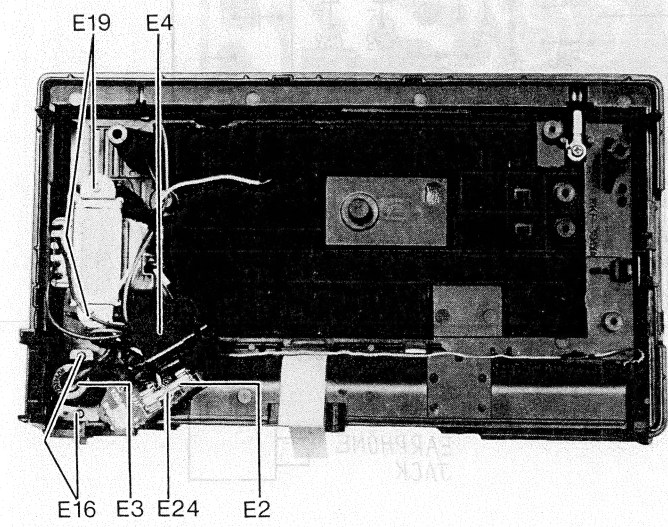


Fig. 12

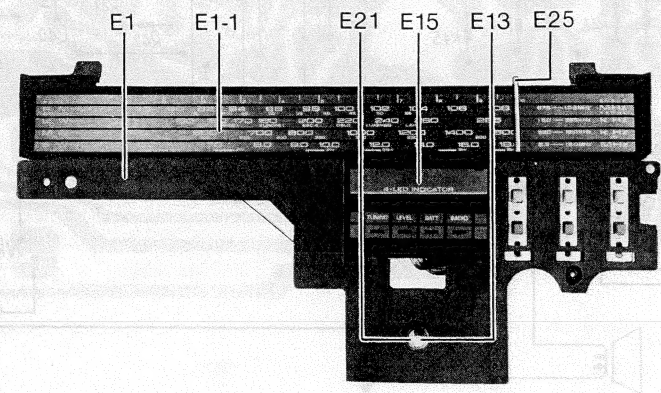


Fig. 13

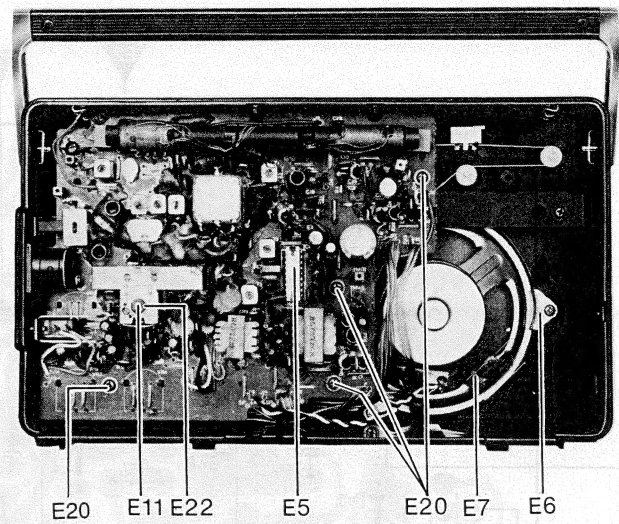


Fig. 14

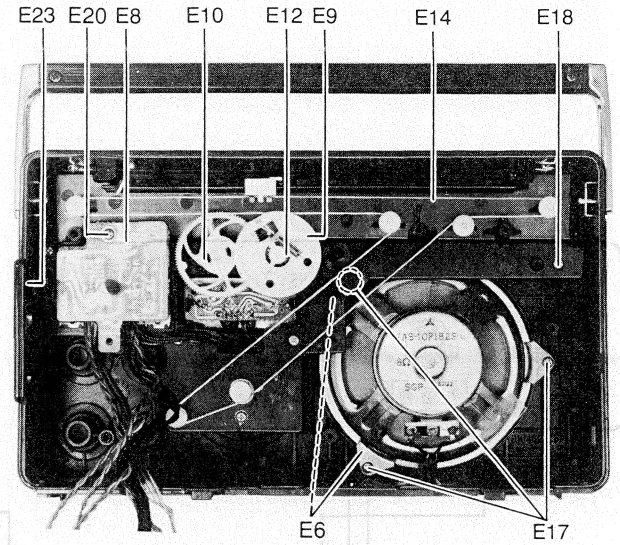


Fig. 15

REPLACEMENT PARTS LIST RF-1405LBS (RD83072086S2)			
Notes: 1. Important safety notice. Components identified by Δ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts. 2. The S mark indicates service standard parts and may differ from production parts. 3. RESISTORS & CAPACITORS Unless otherwise specified. All resistors are in OHMS (Ω) K=1000Ω, M=1000kΩ All capacitors are in MICRO FARADS (μF) P=μF			
*Type & Wattage of Resister Type ERC:Solid ERX:Metal Film ERW:Wirewound Resister ERD:Carbon ERG:Metal Oxide ERS:Fusible Resister RRD:Chip ERO:Metal Film ERF:Cement Resister Wattage 10,16:1/8W 14,25:1/4W 12:1/2W 1:1W 2:2W 3:3W			
*Type & Voltage of Capacitor Type ECFW:Semi-conductor ECCD,ECKD,ECBT: Ceramic ECQS:Styrol ECQM,ECQV,ECQG: Polyester ECUX:Chip ECEA,ECSZ :Electrolytic ECMS:Mica ECQP :Polypropylene			
Voltage ECQ Type ECQG, ECQV, Type ECSZ Type Others 1H: 50V 0,5: 50V 0F:3.15V 0J :6.3V 1H,1V,50: 50V 2A:100V 1:100V 1A:10V 1A :10V 1J : 63V 2E:500V 2:200V 1V:35V 1C :16V 2A :100V 2H:500V 0J:6.3V 1E,25:25V			
Ref.No.	Part No.	Part Name & Description	Per Set
INTEGRATED CIRCUIT, TRANSISTORS AND DIODES			
IC1	AN7220A	IC	1
Q1,2	2SC1674	Transistor (Si)	2
Q3	2SC1675	Transistor (Si)	1
Q4,6,7,8,12~15	2SC828	Transistor (Si)	8
Q5,9	2SA564	Transistor (Ge)	2
Q10,11	2SC1383	Transistor (Si)	2
D1,6,16	20A90	Diode (Ge)	3 S
D2,3,18	RVDS113	Diode (Si)	3 S
D4,7,17	RVDVD1272LE	Diode (Si)	1
D5	RVDVD1170LE	Diode (Si)	1
D8~11	RVDW06B	Diode (Si)	4
D12~15	RADSLP1011	Diode (Ga)	1
COILS AND TRANSFORMERS			
L1	RLD4Y44	Tuning Coil, FM	1
L3	RLO4N166	Oscillator Coil, FM	1
L5,6	RLF6E10	Antenna Coil, LW, MW	1
L7	RLA3M10	Antenna Coil, SW	1
L8	RLO1M4	Oscillator Coil, LW	1
L9	RLO2M6	Oscillator Coil, MW	1
L10	RLO3M31	Oscillator Coil, SW	1
T1,3	RLI4M101	IFT, FM	2 S
T2	RLI2M213	IFT, AM	1
T4	RLT3F45	Input Transformer	1
T5	RLT2G28	Output Transformer	1
T6	RLT5J269	Power Transformer	1 Δ
VARIABLE RESISTORS			
VR1	EVHOXAF20B54	Variable Resistor, 50kΩ (B)	1
VR2	EVHOXAF20B14	Variable Resistor, 10kΩ (B)	1
VR3	EVHOXAF20D54	Variable Resistor, 50kΩ (D)	1

Ref. No.	Part No.	Part Name & Description	Per Set	Ref. No.	Part No.	Part Name & Description	Per Set
VARIABLE CAPACITORS				E16	XTN23+8B	Screw, Voltage Selector M'tg	2 S
VC3,4, 21,32	RCV4RC2V1L	Tuning Capacitor, w/Trimmer Capacitor (CT5,14,22,34)	1	E17	XTN3+10B	Screw, Speaker M'tg	3 S
CT25	RCV1T16M	Trimmer Capacitor	1	E18	XTN3+12B	Screw, Chassis M'tg	5 S
CT17,36	RCV2T16M	Trimmer Capacitor	2	E19	XTW3+16F	Screw, Transformer M'tg	2
CERAMIC FILTERS				E20	XTW3+12FR	Red Screw, Circuit Board M'tg	6
CF1	RVFSFEL07MSR	Ceramic Filter	1	E21	XNS9	Nut, Tuning Shaft M'tg	1 S
CF2	RVFCFM2455D	Ceramic Filter	1	E22	XUC25FT	Circlip	1 S
COMPONENT COMBINATION				E23	RBD122Z	Knob, Radio/Phono	1
Z1	RXABPW5	Component Combination	1	E24	XBA2C05TRO	Fuse, T500mA	1 A
SPEAKER				E25	RDP813Z	Pointer, Dial	1
	EAS10P182S	Speaker, 10cm (4"), 8Ω	1	ACCESSORIES			
SWITCHES					XEH1A1-P	Magnetic Earphone	1 S
S1	RSR4F02Z	Switch, Band	1		RJA20Z	Power Cord, AC	1 A S
S2~S4	RSHX028Z	Switch, LED, BATT SAVE, RADIO	3		RQE13Z	Caution Tag	1
S5	TSE346	Switch, Radio/Phono	1	PACKING MATERIALS			
S7	RSR2A01Y	Switch, Voltage Selector	1 A		XZB40X39A04	Polyethylene Cover	1 S
JACKS					XZB10X25A04	Polyethylene Cover	1 S
J1	RJJ32E	Jack, Earphone	1 S		RPN9347Z	Pad Complete	1
J2	RJJ115Z	Jack, AC IN	1 A		RPK984Z	Gift Box	1
J3	RJS15A	Jack, Din	1	PRINTED MATERIALS			
CABINET PARTS					RQX6586Y	Instruction Book	1
K1	RYMF1405LBSX	Front Cabinet Ass'y	1				
K1-1	RKX199Z	Handle	1				
K1-2	RKX184Z	Spacer, Arm	2				
K1-3	RKX204Z	Arm, Handle	2				
K1-4	QBP1817	Stopper, Arm	2				
K1-5	XSB3+6FZ	Screw, Handle M'tg	2				
K2	RYFF1405LBSZ	Rear Cabinet Ass'y	1				
K2-1	RJC603Z	Spring, Battery - Side	1				
K2-2	RJT398A	Connecting Pipe	1				
K2-3	RJC205B	Terminal, Battery + Side	1				
K3	RYNF1405LBSZ	Battery Cover Ass'y	1				
K4	XEARR170FKY	Telescopic Antenna	1				
K5	RDS5104Z	Spring, Button	6				
K6	RBC279P	Button, Radio On	1				
K7	RBC279Q	Button, Radio Off	1				
K8	RBC279R	Button, Off	2				
K9	RBC279S	Button, Batt Saver On	1				
K10	RBC279T	Button, LED On	1				
K11	RBN533Z	Knob, Tuning	1				
K12	RBN534Z	Knob, Volume etc.	3				
K13	RBS168Z	Knob, Band	1				
K14	RHR1127Z	Stopper, Button	6				
K15	XTW3+10F	Screw, Telescopic Antenna M'tg	1				
K16	XTB3+45CFN	Screw, Cabinet M'tg	2				
K17	XTN3+10B	Screw, Cabinet M'tg	4 S				
ELECTRICAL PARTS							
E1	RZAF1405LBSZ	Dial Chassis Ass'y	1				
E1-1	RKD563W	Dial Scale	1				
E2	QTF1054	Holder, Fuse	2 A				
E3	RUV426Z	Cover, Voltage Selector	1 A				
E4	RUV482Z	Cover, AC IN Jack	1 A				
E5	RMC506Z	Shield Cover, IC	1				
E6	RMS12B	Bracket, Speaker	3				
E7	RMX198Z	Insulator	1				
E8	RMX183Z	Insulator	1				
E9	RDD3383Z	Drum, Dial	1				
E10	RDG5694Z	Gear, Dial	1				
E11	RDF864Z	Shaft, Band Switch	1				
E12	RDS4090A	Spring, Dial	1				
E13	RDT2252Z	Shaft, Tuning	1				
E14	RDZ05Z	Cord, Dial	1				
E15	RGK957Z	Indicating Plate, LED	ROLL 1				

Ref. No.	Part No.	Value	Ref. No.	Part No.	Value	Ref. No.	Part No.	Value	Ref. No.	Part No.	Value
	RESISTORS		C15	ECKD1H103MD	0.01	C100	ECCD1H101K	100P			
R1	ERD25FJ563	56K S	C16	ECKD1H103MD	0.01						
R2	ERD25FJ562	5.6K S	C18	ECKD1H103MD	0.01						
R3	ERD25FJ331	330 S	C19	ECCD1H040C	4P						
R4	ERD25FJ470	47 S	C20	ECCD1H270KC	27P						
R5	ERD25FJ561	560 S	C23	ECCD1H470KC	47P						
R6	ERD25FJ103	10K S	C24	ECEA50Z1	1 S						
R7	ERD25TJ104	100K S	C26	ECKD1H103ZF	0.01						
R8	ERD25FJ271	270 S	C27	ECKD1H103ZF	0.01						
R9	ERD25FJ223	22K S	C28	ECFVD683MD	0.068						
R10	ERD25FJ102	1K S									
			C29	ECKD1H103ZF	0.01						
R11	ERD25TJ224	220K S	C30	ECCD1H331K	330P						
R12	ERD25FJ393	39K S	C31	ECCD1H180KC	18P						
R13	ERD25TJ474	470K S	C33	ECQS05221JZ	220P						
R15	ERD25FJ470	47 S	C35	ECQS05141JZ	140P						
R16	ERD25FJ473	47K S	C37	ECEA25Z4R7	4.7 S						
R17	ERD25FJ393	39K S	C38	ECQS05371JZ	370P						
R18	ERD25FJ222	2.2K S	C39	ECQP2A392JZ	0.0039						
R19	ERD25FJ471	470 S	C40	ECEA50Z2R2	2.2 S						
R20	ERD25TJ224	220K S	C41	ECKD1H103ZF	0.01						
R21	ERD25TJ564	560K S									
			C42	ECEAOJS102	1000 S						
R22	ERD25FJ153	15K S	C43	ECCD1H221K	220P						
R23	ERD25FJ100	10 S	C44	ECFVD153MD	0.015						
R24	ERD25FJ470	47 S	C45	ECFVD333MD	0.033						
R25	ERD25TJ474	470K S	C46	ECKD1H103MD	0.01						
R26	ERD25FJ473	47K S	C47	ECEALAS101	100 S						
R27	ERD25TJ823	82K S	C48	ECEA25Z4R7	4.7 S						
R28	ERD25TJ155	1.5M S	C49	ECKD1H223ZF	0.022						
R29	ERD25FJ223	22K S	C50	ECFVD683MD	0.068						
R30	ERD25FJ222	2.2K S	C51	ECFVD104MD	0.1						
R31	ERD25FJ681	680 S									
			C52	ECKD1H103MD	0.01						
R32	ERD25FJ681	680 S	C53	ECFVD153MD	0.015						
R35	ERD25FJ272	2.7K S	C54	ECFVD473MD	0.047						
R36	ERD25FJ151	150 S	C55	ECCD1H050CC	5P						
R37	ERD25TJ224	220K S	C56	ECFVD683MD	0.068						
R38	ERD25TJ105	1M S	C57	ECEAOJS471	470 S						
R39	ERD25FJ151	150 S	C58	ECKD1H102ZF	0.001						
R40	ERD25FJ222	2.2K S	C59	ECEA50Z1	1 S						
R41	ERD25TJ683	68K S	C60	ECFVD223MD	0.022						
R42	ERD25FJ391	390 S	C61	ECKD1H102ZF	0.001						
R43	ERD25FJ101	100 S									
			C62	ECEALCS330	33 S						
R44	ERD25FJ820	82 S	C63	ECFVD473MD	0.047						
R45	ERD25FJ561	560 S	C64	ECFVD333MD	0.033						
R46	ERX1ANJR47	0.47 S	C65	ECEA50Z1	1 S						
R47	ERD25TJ224	220K S	C66	ECEA50Z1	1 S						
R48	ERD25TJ105	1M S	C67	ECFVD683MD	0.068						
R50	ERD25FJ272	2.7K S	C68	ECKD1H472MD	0.0047						
R51	ERD25TJ184	180K S	C69	ECFVD223MD	0.022						
R52	ERD25FJ6R8	6.8 S	C70	ECEAOJS471	470 S						
R53	ERD25FJ682	6.8K S	C71	ECEALAS470	47 S						
R54	ERD25FJ333	33K S									
			C72	ECFVD223MD	0.022						
R55	ERD25FJ561	560 S	C73	ECFVD103MD	0.01						
R56	ERD25FJ221	220 S	C74	ECKD1H332MD	0.0033						
R57	ERD25FJ122	1.2K S	C75	ECEALCS222	2200 S						
R58	ERD25FJ101	100 S	C76	ECEA50Z1	1 S						
R59	ERD25FJ681	680 S	C77	ECKD1H103ZF	0.01 S						
R60	ERD25FJ821	820 S	C78	ECKD1H103ZF	0.01 S						
R61	ERD25FJ100	10 S	C79	ECKD1H103ZF	0.01 S						
R62	ERD25FJ332	3.3K S	C80	ECKD1H103ZF	0.01 S						
R63	ERD25FJ222	2.2K S	C81	ECFVD473MD	0.047						
R64	ERD25FJ473	47K S									
			C82	ECCD1H100KC	10P						
R65	ERD25FJ102	1K S	C83	ECKD1H103MD	0.01						
R66	ERD25FJ332	3.3K S	C84	ECCD1H331K	330P						
R67	ERD25TJ104	100K S	C85	ECFVD473MD	0.047						
R68	ERD25FJ473	47K S	C86	ECCD1H331K	330P						
R69	ERD25FJ153	15K S	C87	ECCD1H030C	3P						
R70	ERD25FJ822	8.2K S	C88	ECCD1H101K	100P						
	CAPACITORS		C89	ECCD1H270KC	27P						
C1	ECKD1H102ZF	0.001	C90	ECKD1H103MD	0.01						
C2	ECCD1H3R5C	3.5P	C91	ECFVD223MD	0.022						
C3	ECFVD223MD	0.022									
C6	ECCD1H180KC	18P	C93	ECEA50ZR1	0.1 S						
C7	ECCD1H100KC	10P	C94	ECFVD683MD	0.068						
C8	ECCD1H331K	330P	C95	ECKD1H152MD	0.0015						
C9	ECCD1H560KC	560P	C96	ECKD1H103ZF	0.01						
C10	ECKD1H103MD	0.01	C97	ECCD1H101K	100P						
C11	ECCD1H331K	330P	C98	ECCD1H050CC	5P						
C12	ECCD1H100KC	10P	C99	ECCD1H070DC	7P						